CLAIMS

What I claim as my invention is:

1. An on and off switch for light in a channel comprising a transparent piezoelectric light channel that is made
   A. larger in cross section by the action of the electric field of light passing through the channel there by opening to the passage of the light signals for the switch to be in the on condition
   B. smaller in cross section by the action of the electric field of light passing through the channel there by closing to the passage of the light signals for the switch to be in the off condition.
2. [An on and off switch for light in a channel comprising a channel next to a piece of piezoelectric material where the channel carrying the light is made
3. larger in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material that by contracting opens the light carrying channel to light signals causing the on condition
   A. smaller in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material that by expanding into the light carrying channel closes the light channel to light signals causing the off condition.]

2. An on and off switch for light in a channel comprising a channel next to a piece of piezoelectric material where the channel carrying the light is made
   A. larger in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric

material that by contracting opens the light carrying channel to light signals causing the on condition
B. smaller in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material that by expanding into the light carrying channel closes the light channel to light signals causing the off condition.

3. An on and off switch for light signals in a channel comprising a compressible fluid portion of the channel with a side that is composed of a piezoelectric material that responds to the electric field in the light in the channel to
   A. Contract the piezoelectric wall of the channel to open up the channel to larger dimensions so that the light signal easily passes through the channel causing the on condition.
   B. Expanding into the light channel to close the light channel to smaller dimensions so that the light signal may not pass through the channel causing the off condition.
4. A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is the same wavelength as the light signal in the channel that is switched on and off.
5. A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is a shorter wavelength than the light signal in the channel that is switched on and off.
6. A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is a longer wavelength than the light signal in the channel that is switched on and off.

7. A light switch for light signals as claimed in claim one where the piezoelectric material is transparent to the light passing through it.
8. A light switch for light signals as claimed in claim three where the compressible fluid is a gas.
9. A light switch for light signals as claimed in claim three where the compressible fluid is a mixture of gases.
10. A light switch for light signals as claimed in claim three where the compressible fluid is a liquid.
11. A light switch for light signals as claimed in claim three where the compressible fluid is a mixture of liquids.
12. A light switch for light signals as claimed in claims two and three were more than one wall of the switch is piezoelectric material that responds to the electric field of the light in the channel turning the switch on and off.
13. A light switch for light signals as claimed in claims one, two, and three were the piezoelectric material responds to power level of the light in the channel turning the switch on and off.
14. A light switch for light signals as claimed in claims one, two and three where the light that accomplishes the switching of the light signal in the channel is imposed upon a conductor near the light channel with the signal that is switched in it.

CLAIMS

What I claim as my invention is:

1. An on and off switch for light in a channel comprising a transparent piezoelectric light channel that is made
   A. larger in cross section by the action of the electric field of light passing through the channel there by opening to the passage of the light signals for the switch to be in the on condition
   B. smaller in cross section by the action of the electric field of light passing through the channel there by closing to the passage of the light signals for the switch to be in the off condition.
2. An on and off switch for light in a channel comprising a channel next to a piece of piezoelectric material where the channel carrying the light is made
   A. larger in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material that by contracting opens the light carrying channel to light signals causing the on condition
   B. smaller in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material that by expanding into the light carrying channel closes the light channel to light signals causing the off condition.
3. An on and off switch for light signals in a channel comprising a compressible fluid portion of the channel with a side that is composed of a piezoelectric material that responds to the electric field in the light in the channel to
   A. Contract the piezoelectric wall of the channel to open up the channel to larger dimensions so that the light

signal easily passes through the channel causing the on condition.

B. Expanding into the light channel to close the light channel to smaller dimensions so that the light signal may not pass through the channel causing the off condition.

4. A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is the same wavelength as the light signal in the channel that is switched on and off.
5. A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is a shorter wavelength than the light signal in the channel that is switched on and off.
6. A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is a longer wavelength than the light signal in the channel that is switched on and off.
7. A light switch for light signals as claimed in claim one where the piezoelectric material is transparent to the light passing through it.
8. A light switch for light signals as claimed in claim three where the compressible fluid is a gas.
9. A light switch for light signals as claimed in claim three where the compressible fluid is a mixture of gases.
10. A light switch for light signals as claimed in claim three where the compressible fluid is a liquid.
11. A light switch for light signals as claimed in claim three where the compressible fluid is a mixture of liquids.
12. A light switch for light signals as claimed in claims two and three were more than one wall of the switch is

piezoelectric material that responds to the electric field of the light in the channel turning the switch on and off.

13. A light switch for light signals as claimed in claims one, two, and three were the piezoelectric material responds to power level of the light in the channel turning the switch on and off.

14. A light switch for light signals as claimed in claims one, two and three where the light that accomplishes the switching of the light signal in the channel is imposed upon a conductor near the light channel with the signal that is switched in it.

Claims discussion

Introduction:

In this document the claims given in Patent Application 10/732,857 entitled the LIGHT TRIGGERED LIGHT SWITCH will be shone to be unique and different from the claims given in United States Patent number 6,320,994 entitled the TOTAL INTERNAL REFLECTION OPTICAL SWITCH. In brief, THE LIGHT TRIGGERED LIGHT SWITCH is an on/off switch, and uses the power of light in or near the channel to actuate the switch, and the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is not an on/off switch, and does not use the power of the light in or near the channel to actuate the switch. The following Table 1 allows a comparison of the two inventions.

Compare	6,320,994	10/732,857
Not same	First and second wave guides switch	On and off switch
Not same	A trench that is wide and gets narrow and wide again along its length	A light channel that closes in time as the piezoelectric material swells under the action of the electric field of light
Not same	First index of refraction for light to pass	Channel is large enough for light to pass
Not same	Gap filled with gas to reflect light	Channel is too small so light is stopped
Not same	Gas bubble generated by heat	Light electrical power
Not same	Control signal moves bubble	Piezoelectric responds to light power changes the dimensions of the channel
Not same	Heaters and bubbles	No heaters no bubbles
Notes	Signal speed slower than 10^{-9} sec.	Light faster than 10^{-11} seconds
Notes	Present technology, no advantage	More than 100 times faster, much better

Table 1.

The discussion below works with the words of each patent clearly exposing the differences between these two inventions so that the superior technology of the LIGHT TRIGGERED LIGHT SWITCH may receive the patent protection that it disserves.

Claims discussion:

LIGHT TRIGGERED LIGHT SWITCH Claim 1:

1. The first words of Claim 1 in LIGHT TRIGGERED LIGHT SWITCH read as follows:

"An on and off switch for light in a channel"

In the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is not referred to as an on and off switch. U.S. Patent number 5,204,921 is referenced, and it "may be switched 'on' or 'off,'" in column 1 line 59. The term cross-connect switch is used in column 2 in line 32.

In the TOTAL INTERNAL REFLECTION OPTICAL SWITCH the terms "reflecting state" and "non-reflecting state" are used in column 3 line 59 and 64 to describe the action of the cross-connect switch not "on and off." In columnl line 59 "on" and "off" are discussed pointing out the analogy to on and off that reflecting or non-reflecting, but the light is not shut off as it is in the LIGHT TRIGGERED LIGHT SWITCH when the piezoelectric material makes the channel too small.

Nowhere in the claims of patent number 6,320,994 which teaches TOTAL INTERNAL REFLECTION OPTICAL SWITCH are the words "on and off" mentioned.

Clearly the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is not an on and off switch as the LIGHT TRIGGERED LIGHT SWITCH is.

2. The second words in Claim 1 in the LIGHT TRIGGERED LIGHT SWITCH are as follows:

"a channel comprising a transparent piezoelectric light channel"

No where in patent 6,320,994 is a transparent piezoelectric light channel mentioned. A "piezoelectric transducer or micromechanical devices" are mentioned (Col.5, line 59-60), but they put pressure on the fluid in the gap to push the gas around. They do not have to be transparent since they are not part of the light channel or waveguide as is claimed in Claim 1 of the LIGHT TRIGGERED LIGHT SWITCH. These "piezoelectric transducer or micromechanical devices" would be in position 142 in the drawings of patent 6,320,994. Section 113 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is not a transparent piezoelectric material, it is the region where the bubble moves in and out (Col.5, lines1-3). If 113 were a transparent piezoelectric material like quartz or lithium niobate, the bubble could not move in out. The term "transparent piezoelectric" is never used in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH patent.

In column 5 line 59 and 60 piezoelectric transducers are mentioned, and the last words of Claim 1 of patent 6,320,994 are "control

signal." The "control signal" would be what actuates the piezoelectric transducer. Control signals can be switched on and off by a hand actuated switch, an electromagnetic solenoid, a relay, or a transistor circuit. The fastest of these would be the transistor circuit, which can switch at 10^{-9} seconds in the best conditions. This is one billionth of a second. Many devices use transistors to switch and they only achieve 10^{-7} seconds because of the mechanical responses to the signal that the transistor provides. This is a ten millionth of a second. The LIGHT TRIGGERED LIGHT SWITCH is much faster at a one hundred billionth of a second.

No where in the claims of patent 6,320,994 is a piezoelectric element mentioned.

3. The next words in Claim 1 of the disclosure of the LIGHT TRIGGERED LIGHT SWITCH are as follows:

"light channel that is made
A larger in cross section
B smaller in cross section"

The Light channels or waveguides in patent 6,320,994 which teaches TOTAL INTERNAL REFLECTION OPTICAL SWITCH are not described as getting larger or smaller in the claims or the disclosure.

In column 5 lines 42 through 44 patent 6,320,994 describes the pressure of the trench for the fluid that has the same refractive index as the central core of the waveguides is what is made larger or smaller to push the bubble of gas to the desired position using the

action of two diaphragms. This trench is not a light channel or waveguide as it is in the LIGHT TRIGGERED LIGHT SWITCH.

4. The next words in Claim 1 of the LIGHT TRIGGERED LIGHT SWITCH are as follows:

"by the action of the electric field of light passing through the channel"

No where in the patent 6,320,994 is the electric field of the light in the channels referred to.

In the disclosure of the LIGHT TRIGGERED LIGHT SWITCH the DETAILED DESCRIPTION OF THE INVENTION, the second sentence teaches that the electric field of the light acts upon the piezoelectric material to make the switch actuate. From that second sentence on through mathematical calculations with the Poynting vector equation, that is used to explain the way the electric field of the light in the channel actuates the piezoelectric material causing it to expand or contract, and on into the description of each drawing, the light power is triggering the switching.

By actuating a switch with the electric field of the light, switching speeds of less than one hundred billionth of a second 10^{-11} can be achieved. By actuating a switch by the "control signal" of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH, switching speeds of a billionth of a second 10^{-9} are the fastest that can be achieved.

5. The next words in Claim 1 of the LIGHT TRIGGERED LIGHT SWITCH are as follows in the A and B portions:

"A by opening to the passage of the light signals
B by closing to the passage of the light signals"

The claims for patent 6,320,994 present the waveguides encountering the gap that is full of liquid or gas not reflecting or reflecting the light signals. This switch changes the direction of the light; it does not close to the passage of light signals, as does the LIGHT TRIGGERED LIGHT SWITCH.

6. The last words in Claim 1 of the LIGHT TRIGGERED LIGHT SWITCH are as follows in the A and B portions:

"A for the switch to be in the on condition
B for the switch to be in the off condition."

The switch being described is an on and off switch. This is different from the TOTAL INTERNAL REFLECTION OPTICAL SWITCH, which changes the direction of the light by reflection.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 1:

1. The first words of Claim 1 in Patent 6,320,994 read as follows:

"An optical switch comprising: a substrate including first and second wavegiudes,"

The whole object of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is to reflect the light into the second channel or not, while the LIGHT TRIGGERED LIGHT SWITCH teaches how the

electric field of the light can shut off the light passing through the switch.

The second words of Claim 1 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH are as follows:

"said first and second waveguides intersecting at a gap having a predetermined width,"

From figure 5 and 11 one learns that "intersecting at a gap," means that the gap is across the waveguides. They intersect it with an angle (Figure 5 and 11). This is to facilitate the reflection that the switch is designed to do. In the disclosure of the LIGHT TRIGGERED LIGHT SWITCH one finds described the wall of the waveguide closes in to shut off the light signal (Figure 1B, 2B, and 3B).

2. The next words of Claim 1 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH are as follows:

"said first and second waveguides being positioned such that light traversing said first waveguide enters said second wave guide when said gap, said first region having parallel walls is filled with a liquid having a first index of refraction"

The light passes through when the gap is filled with a fluid having the first index of refraction. The gap has parallel walls so that the light makes it through the gap to the second part of the light channel on the other side. These parallel walls do not change to a different dimension as do the sides of the waveguide in the LIGHT TRIGGERED LIGHT SWITCH (Figure 1B, 2B, and 3B). The

parallel walls of patent 6,320,994 are at an angle from the waveguide path (Figure 5 and 11). The thing that changes in a TOTAL INTERNAL REFLECTION OPTICAL SWITCH is the liquid having a first index of refraction being replaced with a bubble. The light passes straight through the LIGHT TRIGGERED LIGHT SWITCH when the power of the light in or near the waveguide path is week and the voltage in it is not sufficient to bend the walls of the channel. Clearly these two switches function in completely different ways.

3. The next words of the Claim 1 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH are as follows:

"while light traversing said first waveguide is reflected by said gap when said gap is filled with a gas,"

The gap numbered region 113 on the drawings is usually filled with a liquid having the first index of refraction, but when it is filled with a gas the light is reflected as is taught in Claim 1 of patent 6,320,994. In the LIGHT TRIGGERED LIGHT SWITCH, light in or near to the wageguide or light channel is of sufficient power to cause the piezoelectric material in the switch to change dimensions so that the light can no longer pass through the channel. That is as is claimed in Claims 1, 2, and 3 of the LIGHT TRIGGERED LIGHT SWITCH. Clearly these switches described in patent 6,320,994 and those in application 10/732,857 function completely differently.

4. The next words of Claim 1 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH are as follows:

"Wherein said gap is part of a trench in said substrate,"

The gap is a trench in patent 6,320,994 that fills with liquid and gas to cause the switch to reflect or not reflect the light signal. In Application 10/732,857 Claims 3, 9, 10, 11,and 12 there is a portion of the waveguide that is filled with a compressible fluid that is not compressed or is compressed depending on the light acting on the piezoelectric element in the switch pictured in Figure 3A and 3B. In the TOTAL INTERNAL REFLECTION OPTICAL SWITCH, bubbles are manipulated in and out of the gap, which is part of the trench in the substrate (Column 5, lines 1-50). Clearly these switches function completely differently.

5. The next words of Claim 1 in the Total Internal Reflection Optical Switch are as follows:

"said trench having a first region containing said gap and a second region adjacent to said gap, said second region having a width greater than said width of said first region;"

The walls of the trench described here do not move or change shape, accept for a section 142, and the waveguide walls do not move or change shape. A fluid fills the gap and trench and a bubble is manipulated in and out of the part of the trench called the gap. This is different from the walls of the waveguide in the LIGHT TRIGGERED LIGHT SWITCH, which change shape and move in to choke off the flow of light through the channel. The walls that of the waveguide in Claim 1 of application 10/732,857 are the walls of a piece of transparent piezoelectric material that the waveguide is made of. In Claim 2 of application 10/732,857 a wall or walls of the wave guide moves. The piezoelectric material that the wall of the wave guides is made of moves. In Claim 3 of application 10/732,857

the wall of a piece of piezoelectric material that the wall of the wave guide is made of moves, and for the switch of Claim 3 the waveguide has a fluid portion that the piezoelectric moves into. In all these, the piezoelectric responds to the power of the light signal in the waveguide, very different from what is described in patent 6,320,994.

6. The next words of Claim 1 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH are as follows:

"a liquid having said first index of refraction deposed in said first region, said liquid generating a gas when heated to a predetermined temperature;"

The voltage developed in the waveguide or light channel is not mentioned here as it is in the DETAILED DESCRIPTION OF THE INVENTION section of the description of the LIGHT TRIGGERED LIGHT SWITCH. Where the Poynting vector equation is used to derive the voltage of light of a given power and the angstroms of response that can be expected from the piezoelectric material that moves in the switch. Here in patent 6,320,994, generating a gas bubble by heat is the mechanism for actuating the switch. This is very different from the LIGHT TRIGGERED LIGHT SWITCH.

7. The next words of Claim 1 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH are as follows:

"a first heater disposed in said first region for heating said liquid to said predetermined temperature thereby generating a gas bubble in said liquid at said firs region; and"

To accomplish what is described here, a manual switch, relay, solenoid or transistor must switch an electrical signal. The fastest of these is the transistor which can switch in a billionth of a second (10^{-9} seconds), but then the current must flow and the liquid must heat up to the "predetermined temperature." The goal of all of this is that a bubble will be formed that can be moved over to the gap. The maximum speed the TOTAL INTERNAL REFLECTION OPTICAL SWITCH can hope to accomplish will be 10^{-8} or 10^{-7} seconds. In the LIGHT TRIGGERED LIGHT SWITCH, the light in the channel crosses the switch dimensions in 10^{-13} seconds or faster depending on the size of the switch. The LIGHT TRIGGERED LIGHT SWITCH will easily switch faster than 10^{-11} seconds. This is the most important difference between these two inventions, and the compelling reason why the claims of the LIGHT TRIGGERED LIGHT SWITCH should be accepted.

8. The last words of Claim 1 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH are as follows:

"a displacement mechanism for causing said gas bubble in said first region to extend partially into said second region in response to a control signal."

Here it is the "control signal" causing the gas bubble to move to the gap. This is the same as the electrical signal mentioned in Description of the Prior Art part of Application 10/732,857 where United States Patent number 6,594,411, which teaches OPTICAL SWITCH, and is issued to Yueh Liang Chung etal. on July 15 of 2003, is referenced. Patent 6,594,411 makes mention of a piezoelectric element. The piezoelectric element is actuated by an electrical signal. Again, a manual switch, relay, solenoid or

transistor must switch an electrical signal or "control signal." The fastest of these is the transistor which can switch in a billionth of a second (10^{-9} seconds). In the LIGHT TRIGGERED LIGHT SWITCH, the light in the channel crosses the switch dimensions in 10^{-13} seconds or faster depending on the size of the switch. Making the LIGHT TRIGGERED LIGHT SWITCH far superior in design that patent 6,594,411 or 6,320,994, because the piezoelectric elements the switches claimed in the claims of application 10/732,857 responds to the electric field of the light passing through the waveguide of the switch. The response of the piezoelectric elements in the LIGHT TRIGGERED LIGHT SWITCH can easily cause the switch to turn on and off faster than 10^{-11} seconds.

LIGHT TRIGGERED LIGHT SWITCH Claim 2:

1. The first words of Claim 2 in LIGHT TRIGGERED LIGHT SWITCH read as follows:

"An on and off switch for light in a channel comprising a channel next to a piece of piezoelectric material"

Patent 6,320,994, which teaches TOTAL INTERNAL REFLECTION OPTICAL SWITCH, has only one independent claim, which is the first one. Claim 2 in the LIGHT TRIGGERED LIGHT SWITCH is an independent claim and must be compared against Claim 1 of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH. The argument will be the same as was presented for Claim 1 in Application 10/732,857. The difference is that the switch described in Claim 2 has no transparent piezoelectric member that carries the light. The piezoelectric member is next to a transparent material that is carrying the light signal, and the light that causes the

piezoelectric member to change shapes and closes the channel down. The piezoelectric material used may be transparent, but there are less expensive piezoelectric materials that are not transparent that can be used in a switch that is made as this claim describes.

2. The second words in Claim 2 in the LIGHT TRIGGERED LIGHT SWITCH are as follows:

"where the channel carrying the light is made

A. larger in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material

B. smaller in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material"

The switch described here like the one described in Claim 1 the light signal is stopped from passing through the switch because the electric field of light in the waveguide or channel is causing the piezoelectric material of the switch to move. The movement of the piezoelectric material opens up or closes down the channel to the light. This opening or closing causes the on or off of the switch, because light cannot go through a channel that is as small as a quarter of its wavelength. The switch described in patent number 6,320,994 moves a bubble into a small gap to accomplish the reflection of the light into an alternative waveguide or channel. These are two very different means of switching. The LIGHT TRIGGERED LIGHT SWITCH will switch faster than a hundred billionth of a second. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH will not be able to achieve switching in less than a billionth of a second. In this switch, the waveguide that is made smaller as the piezoelectric material gets bigger must be made

out of a flexable material so that it can respond to the pressure of the piezoelectric material.

3. The next words in Claim 2 of the disclosure of the Light Triggered Light Switch are as follows:

"A. that by contracting opens the light carrying channel to light signals causing the on condition
B. that by expanding into the light carrying channel closes the light channel to light signals"

Donald et. Al., U.S.P. No 6,320,994 which teaches TOTAL INTERNAL REFLECTION OPTICAL SWITCH has a trench that narrows down to a gap and then is wider at the other end as Figure 5 and 11 show. Application 11/732,857 has piezoelectric material that in a very short time change their dimensions to close off a light channel. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH is big on both ends and small in the middle while the LIGHT TRIGGERED LIGHT SWITCH changes diameter with time when the light of sufficient power passes through it. These are two very different means of operation, and Application 11/732,857 is superior because it can switch more than 100 times faster.

4. The next words in Claim 2 of the disclosure of the LIGHT TRIGGERED LIGHT SWITCH are as follows:

"A. causing the on condition
B. causing the off condition"

The LIGHT TRIGGERED LIGHT SWITCH claims to be an on/off switch. No where in the claims of Patent number 6,320,994 is on

and off mentioned. The LIGHT TRIGGERED LIGHT SWITCH stops light from continuing down a waveguide or channel. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH turns light from one channel to another.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 2: Claim 2 in Donald et al., U.S.P. No 6,320,994 read as follows:

"The optical switch of claim 1 wherein said displacement mechanism comprises a second heater having a portion thereof located in said first region between said first heater and said second region of said gap."

This claim deals with heaters that are to vaporize and expand the bubble of the fluid in the switch into the gap so the light will be reflected instead of passing through the fluid filled gap. There is an electrical signal that turns these heaters on and off. The electrical signal will be switched on or off by some means previously invented like a hand switch, a solenoid, a relay, or a transistor. The fastest of these is a transistor which can at the fastest switch in a billionth of a second (10^{-9}), then the heater has to boil the fluid. A hundred millionth (10^{-8}) or a ten millionth (10^{-7}) of a second is the fastest that the TOTAL INTERNAL REFLECTION OPTICAL SWITCH can hope to switch. The LIGHT TRIGGERED LIGHT SWITCH is turned on or off by the electric field of light. The LIGHT TRIGGERED LIGHT SWITCH will switch faster than a hundred billionth of a second (10^{-11}) at the slowest. The LIGHT TRIGGERED LIGHT SWITCH can switch in a ten trillionth of a second (10^{-13}), if one chooses the proper wavelength to do the switching. The LIGHT TRIGGERED LIGHT SWITCH is clearly superior to the TOTAL INTERNAL

REFLECTION OPTICAL SWITCH and should be granted patent protection.

LIGHT TRIGGERED LIGHT SWITCH Claim 3:

1. The first words of Claim 3 in LIGHT TRIGGERED LIGHT SWITCH read as follows:

"An on and off switch for light signals in a channel comprising a compressible fluid portion of the channel with a side that is composed of a piezoelectric material"

The arguments for this claim are the same as for Claim 2. The difference is that the material of the wave-guide that the piezoelectric part moves into a compressible fluid instead of compressing a solid. Figure 3 A and B show the compressible fluid before and during response to the electric field of the light in the channel. No bubble is formed in the LIGHT TRIGGERED LIGHT SWITCH where in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH as seen in Figures 5, 6, 7, 10, and 11 a bubble is formed. The speed of the LIGHT TRIGGERED LIGHT SWITCH comes from the response of the piezoelectric crystal to the electric field of the light. The reason the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is so much slower is that signals switched in transistors or slower mechanisms must mechanically or thermally push bubbles around to effect the switching. The LIGHT TRIGGERED LIGHT SWITCH is more than 100 times faster.

2. The second words of Claim 3 in LIGHT TRIGGERED LIGHT SWITCH read as follows:

"piezoelectric material that responds to the electric field in the light in the channel to

A. Contract the piezoelectric wall of the channel to open up

B. Expanding into the light channel to close"

As is illustrated in Figures 3A and 3B the LIGHT TRIGGERED LIGHT SWITCH associated with Application 10/732,857 uses the response of piezoelectric material to the electric field of light to open up or close down the dimensions of the light channel so that light can pass through it or is too small for the light to pass through it. As is illustrated by Figures 5, 6, 7, 8, 10 and 11 of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH which is has been given patent number 6,320,994 the reflection is effected by the manipulation of a bubble into the path of the light signal that is to be switched. These are two different mechanisms. The speed with which invention described in Application 10/732,857 can switch the signal off is much faster than the invention described in patent number 6,320,994 can, because the electric field of light is switching the LIGHT TRIGGERED LIGHT SWITCH. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH depends upon a "control signal" (the last two words of Claim 1) which is turned on by a hand switch, solenoid, relay or transistor to send electricity to push a bubble around by heat or pressure. The transistor switch would be the fastest at 10^{-9} seconds (that is a billionth of a second). The signal then must cause piezoelectric material to put pressure on the gas bubble or the micromechanical device to put pressure on the gas bubble or the heater to heat up the bubble to expand it. These operations make the switch slower than the transistor. Actually the speed that this switch will only be able to switch at 10^{-7} seconds (that is a ten millionth of a second). The LIGHT TRIGGERED LIGHT SWITCH will switch faster than 10^{-11} seconds (that is a

hundred billionth of a second). If the proper wavelength is used the LIGHT TRIGGERED LIGHT SWITCH could switch at 10^{-13} seconds (that is a ten trillionths of a second). It is seen that the LIGHT TRIGGERED LIGHT SWITCH is not the same as the TOTAL INTERNAL REFLECTION OPTICAL SWITCH, and the LIGHT TRIGGERED LIGHT SWITCH is superior and should be granted patent protection.

3. The last words of Claim 3 in LIGHT TRIGGERED LIGHT SWITCH read as follows:

A. " the channel to larger dimensions so that the light signal easily passes through the channel causing the on condition.
B. the light channel to smaller dimensions so that the light signal may not pass through the channel causing the off condition."

These words show that the way that the LIGHT TRIGGERED LIGHT SWITCH turns off the light is by the dimensions of the channel is wider to let the light through or the dimensions of the channel is smaller to stop the light from passing through the channel. It is pointed out in the DETAILED DESCRIPTION OF THE INVENTION section of Application 10/732,857 that when a light channel or waveguide is shrunken to a given dimension then light of 8056 angstroms will no longer pass through it. Lights of shorter wavelength can still pass through it. The 8056 angstrom or longer wavelength light would be the one that is the signal that is switched on or off. The light that is doing the switching could be shorter wavelengths that can still pass and their electric field is effecting the change in dimensions by acting on the piezoelectric material. This specific example is given to teach that the light of specific wavelength and power will switch on or off a signal in an other

specific wavelength. Light is fast and is capable of turning on or off a light signal much faster than the bubble machinations described in Donald et. al., U.S.P. No.6,320,994 column 5 lines 34 to 50.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 3:
Claim 3 in Donald et al., U.S.P. No 6,320,994 read as follows:

"The optical switch of claim 2 wherein said second heater extends into said second region."

This claim teaches that the switch could be made to reflect signals because the bubble moving into the gap more effectively if there is a heater to heat up and expand the bubble that extends into the second region. The mechanism that this claim describes is different from the mechanism described in the claims of The LIGHT TRIGGERED LIGHT SWITCH, which involve light of various wavelengths causing piezoelectric material to change dimensions. Claims 4, 5, 6 and 12, 13, and 14 for the LIGHT TRIGGERED LIGHT SWITCH are about light of various wavelengths influencing piezoelectric material to effect the switch action.

LIGHT TRIGGERED LIGHT SWITCH Claim 4:

The words of the Claim 4 in LIGHT TRIGGERED LIGHT SWITCH read as follows:

"A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is the same wavelength as the light signal in the channel that is switched on and off."

This claim teaches that light that is sufficient power to trigger the switching the LIGHT TRIGGERED LIGHT SWITCH may be of the same wavelength as the light signal that is in the channel that the switch is used to turn on or shut off. The electric field of light is never mentioned in Donald et al., U.S.P. No 6,320,994. The power of light is never mentioned in Donald et al., U.S.P. No 6,320,994. In the LIGHT TRIGGERED LIGHT SWITCH of Application 10/732,857 in the BEST MODE FOR CARRING OUT THE INVENTION section the Poynting vector equation is used to calculate the exact response to be expected from a piezoelectric element from a specific power of light in watts. Clearly these are different inventions.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 4:
1. The first words of Claim 4 in Donald et al., U.S.P. No 6,320,994 read as follows:

"The optical switch of claim 1 wherein said trench comprises a third region having a width greater than said width of said first region, said first region being located between said second and said third regions,"

This portion of the claim makes several things clear. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH has a channel that is wide at one end narrow in the middle and wide again at the other end. This switch does not have a channel that closes down by the action of an electric field on a piezoelectric element as the Light Triggered Light Switch does. Figures 3,5,6,7,8,10, and 11 of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH show clearly that the light signal being switched goes across the thin part of the channel where the bubble can interact with it. Figures 1A, 1B, 2A,

2B, 3A, and 3B show that the light signals in the LIGHT TRIGGERED LIGHT SWITCH travel along the light switch that is actuated by the movement of the piezoelectric element acted upon by the electric field of the light in the waveguide. These switches operate on completely different principals.

2. The next words of Claim 4 in Donald et al., U.S.P. No 6,320,994 read as follows:

"and wherein said displacement mechanism comprises a mechanism for inducing a pressure differential across said fist region."

These words of Claim 4 refer to a piezoelectric transducer or micromechanical device that will move the bubble in or out of the region by pressure to interact with the light reflecting it or letting it pass through the said first region. This is very different from the words of Application 10/732,857 for the LIGHT TRIGGERED LIGHT SWITCH. Which are as follows: "the action of the electric field of light" that is used in Claim 1, or "action of the electric field of the light" that is used in Claim 2, or "responds to the electric field in the light" that is used in Claim 3, or "actuated by the power of the switching light" that is used in Claims 4, 5, and 6, or "that responds to the electric field of the light" that is used in Claim12. This displacement mechanism of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is actuated by a "control signal" as the last words of Claim 1 of patent 6,320,994 teaches. The switch for this "control signal" will be a hand switch, solenoid, relay, or transistor. The fastest of these is the transistor, and as Application number 10/732,857 of the LIGHT TRIGGERED LIGHT SWITCH teaches are more than 100 times slower than the LIGHT TRIGGERED LIGHT SWITCH.

LIGHT TRIGGERED LIGHT SWITCH Claim 5:

The words of Claim 5 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light, which is a shorter wavelength than the light signal in the channel that is switched on and off."

This claim teaches that light that is sufficient power to trigger the switching the LIGHT TRIGGERED LIGHT SWITCH may be a shorter wavelength than the light signal that is in the channel that the switch is used to turn on or shut off. The electric field of light is never mentioned in Donald et al., U.S.P. No 6,320,994. The power of light is never mentioned in Donald et al., U.S.P. No 6,320,994. In the LIGHT TRIGGERED LIGHT SWITCH of Application 10/732,857 in the BEST MODE FOR CARRING OUT THE INVENTION section the Poynting vector equation is used to calculate the exact response to be expected from a piezoelectric element from a specific power of light in watts. Clearly these are different inventions.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 5.

1. The first words of Claim 5 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH patent are as follows:

"The optical switch of claim 4 where in said displacement mechanism"

The "displacement mechanism" is a method of moving a bubble into a narrow gap filled with a liquid so that the light signal will be reflected by the index of refraction of the bubble. The light signal would have crossed the gap when it was filled with the liquid. This is very different mechanism than is described in Claims 1, 2, and 3 of the LIGHT TRIGGERED LIGHT SWITCH that teach that the physical dimensions of the light channel are opened up or closed off by the action of the electric field of the light on piezoelectric elements.

2. The next words of Claim 5 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH patent are as follows:

"comprises a third heater located in said second region or said third region of said trench."

This claim is teaching that a heater can be in the trench on either side of the gap to heat up the liquid so that the bubble will expand and actuate the switch. The heater is supplied the electricity by a "control signal" as Claim 1 has explained. The fastest this method of switching is going to be able to switch in 10^{-7} seconds or 10^{-8} seconds because a hand switch, solenoid, relay, or a transistor will turn on the "control signal." The fastest of these is the transistor switching in 10^{-9} seconds. This is very different from the words of Application 10/732,857 for the LIGHT TRIGGERED LIGHT SWITCH. Which are as follows: "the action of the electric field of light" that is used in Claim 1, or "action of the electric field of the light" that is used in Claim 2, or "responds to the electric field in the light" that is used in Claim 3, or "actuated by the power of the switching light" that is used in Claims 4, 5, and 6, or "that responds

to the electric field of the light" that is used in Claim12. The LIGHT TRIGGERED LIGHT SWITCH will be able to be switched in 10^{-11} seconds or faster. This much faster switch should be granted patent protection.

LIGHT TRIGGERED LIGHT SWITCH Claim 6:

1. The words of Claim 6 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch as claimed in claims one, two, or three that is actuated by the power of the switching light,"

This claim teaches that light that is sufficient power to trigger the switching the LIGHT TRIGGERED LIGHT SWITCH may be a shorter wavelength than the light signal that is in the channel that the switch is used to turn on or shut off. The electric field of light is never mentioned in Donald et al., U.S.P. No 6,320,994. The power of light is never mentioned in Donald et al., U.S.P. No 6,320,994. In the LIGHT TRIGGERED LIGHT SWITCH of Application 10/732,857 in the BEST MODE FOR CARRING OUT THE INVENTION section the Poynting vector equation is used to calculate the exact response to be expected from a piezoelectric element from a specific power of light in watts. Clearly, these are different inventions.

2. The next of Claim 6 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"which is a longer wavelength than the light signal in the channel that is switched on and off"

This claim teaches that the light signal that is switched on or off can be switched on or off by a light signal that is longer in wavelength. Claim 4 and 5 teach that the light signal that is switched on or off can be switched on or off by a light signal that is the same or a shorter wave length than the light signal that is being switched on or off. This switching by light is the key advantage of this the Application 10/732,857, which teaches LIGHT TRIGGERED LIGHT SWITCH. Light is so much quicker than control signals. Patent number 6,320,994 is turned on or off by a "control signal" as is seen in column 7 line 11. Which are the last words of Claim 1 of that patent. These two inventions are very different in their action.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 6.

1. The first words of Claim 6 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH patent are as follows:

"The optical switch of claim 4 wherein said displacement mechanism"

The "displacement mechanism" is a method of moving a bubble into a narrow gap filled with a liquid so that the light signal will be reflected by the index of refraction of the bubble. The light signal would have crossed the gap when it was filled with the liquid. This is very different mechanism than is described in Claims 1, 2, and 3 of the LIGHT TRIGGERED LIGHT SWITCH that teach that the physical dimensions of the light channel are opened up or closed off by the action of the electric field of the light on piezoelectric elements. The LIGHT TRIGGERED LIGHT SWITCH is very

different from the TOTAL INTERNAL REFLECTION OPTICAL SWITCH and should be granted patent protection.

2. The rest of the words of Claim 6 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH patent are as follows:

"comprises a mechanical device for displacing said liquid in said second or said third region of said trench."

These words of Claim 4 refer to a piezoelectric transducer or micromechanical device that will move the bubble in or out of the region by pressure to interact with the light reflecting it or letting it pass through the said first region. This is very different from the words of Application 10/732,857 for the LIGHT TRIGGERED LIGHT SWITCH. Which are as follows: "the action of the electric field of light" that is used in Claim 1, or "action of the electric field of the light" that is used in Claim 2, or "responds to the electric field in the light" that is used in Claim 3, or "actuated by the power of the switching light" that is used in Claims 4, 5, and 6, or "that responds to the electric field of the light" that is used in Claim12. This displacement mechanism of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is actuated by a "control signal" as the last words of Claim one of patent 6,320,994 teaches. The switch for this "control signal" will be a hand switch, solenoid, relay, or transistor. The fastest of these is the transistor, and as Application number 10/732,857 of the LIGHT TRIGGERED LIGHT SWITCH teaches are more than 100 times slower than the LIGHT TRIGGERED LIGHT SWITCH.

LIGHT TRIGGERED LIGHT SWITCH Claim 7:

The words of Claim 7 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:
"A light switch for light signals as claimed in claim one where the piezoelectric material is transparent to the light passing through it."

There are many materials mentioned in Application 10/732,857 that are piezoelectric these are quartz (SiO_2), lithium niobate ($LiNbO_3$), lead zirconate ($PbZrO_3$), lead titanate ($PbTiO_3$), and lead zirconate titanate. Lead zirconate titanate is also called PZT. Of these lithium niobate and quartz are transparent. In Claim 1 of the Light Triggered Light Switch the light channel is composed of transparent piezoelectric material and changes dimensions as the switching light signal acts upon it as Figures 1A and 1B illustrate. No where in Patent 6,320,994 is a transparent piezoelectric element mentioned. No where in Patent 6,320,994 does a light channel change physical dimensions. The light channels in Figures 5 and 11 of Patent 6,320,994 show that the light channels cross the gap where they either go through the liquid or are reflected by the bubble. The piezoelectric element referred to in patent 6,320,994 in column 5 line 59 is depicted in Figure 9 as item number 142 where it is able to change the pressure in the channel in the fluid in order to move the bubble in or out of the gap. The piezoelectric element 142 is actuated by a "control signal" spoken of in column 7 line 11 which are the last words of Claim 1, and, as has been discussed, is slow relative to the LIGHT TRIGGERED LIGHT SWITCH.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 7.

The words of Claim 7 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH patent are as follows:

"The optical switch of claim 1 further comprising a third waveguide having an end terminating in said trench, said third waveguide being

positioned such that light traversing said first waveguide enters said third waveguide when said gap is not filled with liquid."

This claim makes clear that the action of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is diverting light from one channel into another. The bubble is moved to the gap and the light is reflected. This is not how the LIGHT TRIGGERED LIGHT SWITCH works. In Claim 1 of the LIGHT TRIGGERED LIGHT SWITCH the words are as follows:

"light channel that is made
A larger in cross section by opening to the passage of the light signals
B smaller in cross section by closing to the passage of the light signals"

In Claim 2 of the LIGHT TRIGGERED LIGHT SWITCH the words are as follows:

"where the channel carrying the light is made
A.larger in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material
B.smaller in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material"

In Claim 3 of the LIGHT TRIGGERED LIGHT SWITCH the words are as follows:

"A. Contract the piezoelectric wall of the channel to open up
B. Expanding into the light channel to close"

The two switches function differently. Patent 6,320,994 teaches the moving of a bubble to divert light, while Application 10/732,857 teaches the optical waveguide is physically made large enough or pinched down to be too small to turn on or shut off the light.

LIGHT TRIGGERED LIGHT SWITCH Claim 8:

The words of Claim 8 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch for light signals as claimed in claim three where the compressible fluid is a gas"

Figure 3A and 3B of the LIGHT TRIGGERED LIGHT SWITCH application show the area that the piezoelectric part of the switch responds to the electric field of the light to open or close. Claim 8 teaches that the area that the piezoelectric part can be expanding into can be filled with a gas. There is no mention of a bubble being pushed around so that light will bounce off of it as is illustrated in Figures 5, 6, 7, 8, 10, and 11 of Donald et. al., U.S.P. No. 6,320,994. The reason there is no mention of a bubble in the application of the LIGHT TRIGGERED LIGHT SWITCH is that the function of the two switches is completely differently.

TOTAL INTERNAL REFLECTION OPTICAL SWITCH Claim 8.

The words of Claim 8 in the TOTAL INTERNAL REFLECTION OPTICAL SWITCH patent are as follows:

"The optical switch of claim 1 where in said first and second waveguides are aligned such that light from said first waveguide

enters said second wave guide when said first index of refraction differs from the index of refraction of said first and second wavegides."

Donald et. al., U.S.P. No. 6,320,994 speaks often of the refractive index, as does this the last claim in that patent, because the refractive index is key in letting the signal pass or be reflected in the switch. The switching function of the TOTAL INTERNAL REFLECTION OPTICAL SWITCH is controlled by the change in the refractive index when the bubble is moved into the gap in the switch. This is very different from what Application 10/732,857 describes as the function of the switch that it teaches about. The refractive index is never mentioned in Application 10/732,857. The refractive index has nothing to do with the function of the Light Triggered Light Switch. In Claim 1 of the LIGHT TRIGGERED LIGHT SWITCH the words are as follows:

"light channel that is made
A.larger in cross section by opening to the passage of the light signals
B.smaller in cross section by closing to the passage of the light signals"

In Claim 2 of the LIGHT TRIGGERED LIGHT SWITCH the words are as follows:

"where the channel carrying the light is made
A. larger in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material
B. smaller in cross section by the action of the electric field of the light in the channel on the piece of piezoelectric material"

In Claim 3 of the LIGHT TRIGGERED LIGHT SWITCH the words are as follows:

"A. Contract the piezoelectric wall of the channel to open up
B. Expanding into the light channel to close"

The two switches function differently. Patent 6,320,994 teaches the moving of a bubble to divert light, while Application 10/732,857 teaches the optical waveguide is physically made large enough or pinched down to be too small to turn on or shut off the light.

LIGHT TRIGGERED LIGHT SWITCH Claim 9:

The words of Claim 9 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch for light signals as claimed in claim three where the compressible fluid is a mixture of gases."

Figure 3A and 3B of the LIGHT TRIGGERED LIGHT SWITCH show the area that the piezoelectric part of the switch responds to the electric field of the light to open or close. Claim 8 teaches that the area that the piezoelectric part can be expanding into can be filled with a gas. There is no mention of a bubble being pushed around so that light will bounce off of it as is illustrated in Figures 5, 6, 7, 8, 10, and 11 of Donald et. al., U.S.P. No. 6,320,994. The reason there is no mention of a bubble in the LIGHT TRIGGERED LIGHT SWITCH application is that the functions of the two switches are completely different.

LIGHT TRIGGERED LIGHT SWITCH Claim 10:

The words of Claim 10 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch for light signals as claimed in claim three where the compressible fluid is a liquid."

Figure 3A and 3B of the LIGHT TRIGGERED LIGHT SWITCH application show the area that the piezoelectric part of the switch responds to the electric field of the light to open or close. Claim 8 teaches that the area that the piezoelectric part can be expanding into can be filled with a gas. There is no mention of a bubble being pushed around so that light will bounce off of it as is illustrated in Figures 5, 6, 7, 8, 10, and 11 of Donald et. al., U.S.P. No. 6,320,994. The reason there is no mention of a bubble in the LIGHT TRIGGERED LIGHT SWITCH application is that the functions of the two switches are completely different.

LIGHT TRIGGERED LIGHT SWITCH Claim 11:

The words of the Claim 11 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch for light signals as claimed in claim three where the compressible fluid is a mixture of liquids."

Figure 3A and 3B of the LIGHT TRIGGERED LIGHT SWITCH application show the area that the piezoelectric part of the switch responds to the electric field of the light to open or close. Claim 8 teaches that the area that the piezoelectric part can be expanding

into can be filled with a gas. There is no mention of a bubble being pushed around so that light will bounce off of it as is illustrated in Figures 5, 6, 7, 8, 10, and 11 of Donald et. al., U.S.P. No. 6,320,994. The reason there is no mention of a bubble in the LIGHT TRIGGERED LIGHT SWITCH application is that the functions of the two switches are completely different.

LIGHT TRIGGERED LIGHT SWITCH Claim 12:

The words of Claim 12 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch for light signals as claimed in claims two and three were more than one wall of the switch is piezoelectric material that responds to the electric field of the light in the channel turning the switch on and off."

This claim teaches that the LIGHT TRIGGERED LIGHT SWITCH is actuated by the power of light passing through the light channel, the index of refraction is not involved, as the piezoelectric material responds. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH, patent 6,320,994, never mentions the electric field of the light in the waveguides. However, the index of refraction change that occurs when the bubble is force into the gap as Figures 5,6,7,8,10,and 11 show is the key to how the TOTAL INTERNAL REFLECTION OPTICAL SWITCH works.

LIGHT TRIGGERED LIGHT SWITCH Claim 13:

The words of Claim 13 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch for light signals as claimed in claims one, two, and three were the piezoelectric material responds to power level of the light in the channel turning the switch on and off."

This claim teaches that the LIGHT TRIGGERED LIGHT SWITCH is actuated by the power level of light passing through the light channel, the index of refraction is not involved, as the piezoelectric material responds. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH, patent 6,320,994, never mentions the electric field of the light in the waveguides. However, the index of refraction change that occurs when the bubble is force into the gap as Figures 5,6,7,8,10,and 11 show is the key to how the TOTAL INTERNAL REFLECTION OPTICAL SWITCH works.

LIGHT TRIGGERED LIGHT SWITCH Claim 14:

The words of Claim 14 of the LIGHT TRIGGERED LIGHT SWITCH application reads as follows:

"A light switch for light signals as claimed in claims one, two and three where the light that accomplishes the switching of the light signal in the channel is imposed upon a conductor near the light channel with the signal that is switched in it."

This claim teaches that the LIGHT TRIGGERED LIGHT SWITCH is actuated by the light signal passing near the light channel, the index of refraction is not involved, as the piezoelectric material responds to the light signal actuating the switch. The TOTAL INTERNAL REFLECTION OPTICAL SWITCH, patent 6,320,994, uses the

change of the refractive index when a bubble pictured in 5, 6, 7, 8, 10, and 11 of Donald et. al., U.S.P. No. 6,320,994, is pushed around so that light will be totally internally reflected. The two switches function completely differently.

Conclusion:

Please consider the arguments presented here. Please let my claims to be allowed.

Thank you for your time and effort.